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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/565,620	01/25/2006	Kunitake Matsushita	3593 P 015	2328

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EXAMINER	
MULLINS, BURTON S	

ART UNIT	PAPER NUMBER
2834	

MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/565,620	MATSUSHITA ET AL.	
	Examiner	Art Unit	
	BURTON MULLINS	2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 August 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 2* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 2* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 August 2008* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. Replacement drawings were received on 25 August 2008. These drawings are approved.

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ueno et al. (US 5,811,903) in view of Larrabee (US 931,069). Ueno teaches a stepping motor 1 comprising: a stator assembly 2 (Fig.1); a rotary shaft 3 including a lead screw portion end (generally denoted by lead screw 4) and a plain portion end (not numbered, opposite lead screw portion end 4, Fig.1), the plain portion end including the stator assembly 2 and the rotary shaft 3 having both ends thereof rotatably supported by respective bearings (thrust bearings) 5 & 6 (Fig.1); a rotary magnet 17 fixedly mounted on the plain portion end of the rotary shaft, and rotatably housed in the stator assembly 2 (Fig.1); a bracket (not numbered, Fig.14) attached to the stator assembly 2 and having one bearing at one end thereof (i.e., at lead screw portion end in Fig.14); and a thrust mechanism (part of thrust bearing 5) disposed at one end of the rotary shaft opposite the stator assembly 2 (i.e., on the lead screw portion end 4; Fig.1); a recess (not numbered, Fig.1) formed at the one end of the rotary shaft 3 (i.e., on lead screw portion end 4), and a point-contact member (not numbered, ball of thrust bearing 5; Fig.1); the one bearing 5 rotatably supporting the one end of the rotary shaft "positioned toward the lead screw portion end" [sic] (i.e., the bearing 5 supports the lead screw portion end 4 of shaft 3; Fig.1).

Ueno does not teach that the thrust mechanism (thrust bearing) 5 has "a resilient member provided in [the] recess", such that point-contact member (i.e., the ball of thrust bearing 5) is "provided between the resilient member and one bearing of the respective bearings…wherein thrust force is given by the resilient member to the rotary shaft in an axial direction."

Larrabee teaches a step bearing comprising at one end of a rotary shaft 2 and having a resilient (rubber) member 5 provided in a recess formed at the one end of the rotary shaft (Fig.1; p.1:53-61), and a point-contact member (ball) 12 is provided between the resilient member 5 and one bearing (seat disk) 10 of the step bearing, the one bearing rotatably supporting the rotary shaft 2 wherein the thrust force is given by the resilient member 5 to the rotary shaft 2 in an axial direction (by virtue of the rubber member's resiliency). The resilient rubber member aides in the provision of a comparatively frictionless, durable and free-running bearing (p.1:15-23 & p.2:31-39).

It would have been obvious to modify Ueno's bearing and provide a resilient member in a recess of the shaft per Larrabee since this would have provided a comparatively frictionless, durable and free-running bearing.

4. Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueno et al. (US 5,811,903) in view of Yano et al. (US 6,317,287). As described above, Ueno teaches all the features of claim 1 except for a thrust mechanism comprising "a resilient member provided in [the] recess", such that the point-contact member is "provided between the resilient member and one bearing of the respective bearings…wherein thrust force is given by the resilient member to the rotary shaft in an axial direction."

Yano teaches a motor with a lead screw including a thrust bearing structured such that a

a resilient member (compression spring) 9 is provided in a recess 5c in the lead screw shaft 5 (Fig.1), such that point-contact member 10 is provided between the resilient member 9 and one bearing 12 of the respective bearings…wherein thrust force is given by the resilient member to the rotary shaft in an axial direction due to the inherent resilience of the spring 9. Yano's spring preloads the lead screw and cancels backlash (abstract).

It would have been obvious to modify Ueno and provide a resilient member in the recess of the lead screw per Yano since the resilient member would have preloaded the lead screw and canceled backlash.

Regarding claim 2, the resilient member 9 in Yano is a coil spring, and the point-contact member in Ueno is a spherical body made of steel (Fig.1).

5. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ueno et al. (US 5,811,903) in view of Ohashi et al. (US 2005/0115350). Ueno discloses applicant's invention but does not teach that the thrust mechanism has "a resilient member provided in [the] recess", such that the point-contact member is "provided between the resilient member and one bearing of the respective bearings…wherein thrust force is given by the resilient member to the rotary shaft in an axial direction."

Ohashi teaches a motor comprising a shaft 14 with worms 15 and 150 (Fig.2) including a a thrust mechanism disposed at one end of the rotary shaft 14, the thrust mechanism having a resilient member (spring) 51 provided in a recess 14c formed at the one end of the rotary shaft (Fig.4), and a point-contact member (slide) 52 is provided between the resilient member 51 and bearing (base portion) 11e, wherein the thrust force is given by the resilient member 52 to the

rotary shaft in an axial direction [par.0044]. The resilient spring provides a stable thrust force which eases backlash forces in the motor shaft [0021] & [0044].

It would have been obvious to modify Ueno and provide a resilient member per Ohashi to provide a stable thrust force to the shaft and ease backlash.

6. Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishimura (US 6,608,416) in view of Beckingham (US 6,076,266). Nishimura teaches a stepping motor comprising: a stator assembly 1/2 (Fig.4); a rotary shaft 6 including a lead screw portion end (between 10a and 10b; c.2:18-19) and a plain portion end (not numbered), the plain portion end including the stator assembly 1/2 and the rotary shaft having both ends thereof rotatably supported by respective bearings 8 and 11 (Fig.4); a rotary magnet 5 fixedly mounted on the plain portion end of the rotary shaft, and rotatably housed in the stator assembly 1/2 (Fig.4); a bracket (frame) 10 attached to the stator assembly 1/2 and having one bearing 11 at one end thereof (Fig.4); and a thrust mechanism (part of bearing 11) disposed at one end of the rotary shaft opposite the stator assembly 1/2, the thrust mechanism having a recess (not numbered, adjacent ball 12) formed at the one end of the rotary shaft, and a point-contact member (ball) 12, the one bearing 11 rotatably supporting the rotary shaft 6 positioned toward the lead screw portion end.

Nishimura does not teach that the thrust mechanism (thrust bearing) 11 has "a resilient member provided in [the] recess", such that point-contact member (i.e., the ball of thrust bearing 5) is "provided between the resilient member and one bearing of the respective bearings…wherein thrust force is given by the resilient member to the rotary shaft in an axial direction."

Beckingham teaches a theodolite comprising a worm gear shaft 106 (Fig.8) including a a bearing comprising an end cap 144 and a thrust mechanism disposed at one (second) end 110 of the rotary shaft 106, the thrust mechanism having a resilient member (spring) 158 provided in a recess (not numbered) formed at the one end of the rotary shaft (Fig.8), and a point-contact member (ball bearing) 156 is provided between the resilient member 158 and bearing 144, the one bearing 144 rotatably supporting the rotary shaft positioned toward the lead screw portion end, wherein the thrust force is given by the resilient member to the rotary shaft in an axial direction. The resilient spring provides a biasing force for returning the shaft (c.4:62-65).

It would have been obvious to modify Nishimura and provide a resilient member in the recess of the worm shaft per Beckingham since this would have provided a biasing force for returning the shaft.

Regarding claim 2, the resilient member 158 in Beckingham is a coil spring, and the point-contact member in Nishimura is a spherical body (ball) 12 made of steel (c.2:8).

7. Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishimura (US 6,608,416) in view of Ohashi et al. (US 2005/0115350). Nishimura discloses applicant's invention but does not teach that the thrust mechanism has "a resilient member provided in [the] recess", such that the point-contact member is "provided between the resilient member and one bearing of the respective bearings…wherein thrust force is given by the resilient member to the rotary shaft in an axial direction."

Ohashi teaches a motor comprising a shaft 14 with worms 15 and 150 (Fig.2) including a a thrust mechanism disposed at one end of the rotary shaft 14, the thrust mechanism having a resilient member (spring) 51 provided in a recess 14c formed at the one end of the rotary shaft

(Fig.4), and a point-contact member (slide) 52 is provided between the resilient member 51 and bearing (base portion) 11e, wherein the thrust force is given by the resilient member 52 to the rotary shaft in an axial direction [par.0044]. The resilient spring provides a stable thrust force which cases backlash forces in the motor shaft [0021] & [0044].

It would have been obvious to modify Nishimura and provide a resilient member per Ohashi to provide a stable thrust force to the shaft and ease backlash.

Regarding claim 2, the resilient member 51 in Ohashi is a coil spring, and the point-contact member in Nishimura is a spherical body (ball) 12 made of steel (c.2:8).

Response to Arguments

8. Applicant's arguments filed 25 August 2008 have been fully considered but they are not persuasive. Applicant argues that Yano's spring is provided in the end of the shaft within the stator. However, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). Yano's spring preloads the lead screw and cancels backlash (abstract). It would have been obvious to modify Ueno and provide a resilient member in the recess of the lead screw per Yano since the resilient member would have preloaded the lead screw and canceled backlash.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BURTON MULLINS whose telephone number is (571)272-2029. The examiner can normally be reached on 9-5. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Quyen Leung can be reached on (571)272-8188. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/BURTON MULLINS/
Primary Examiner, Art Unit 2834

bsm
29 October 2008